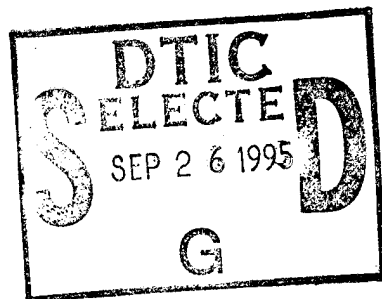


DEVELOPMENT OF AN ULTRA-SAFE RECHARGEABLE LITHIUM-ION BATTERY



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NTIS CRA&I	<input checked="" type="checkbox"/>
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Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution /	
Availability Codes	
Dist	Avail and/or Special
A-1	

Contract # N00014-94-C-0141
ARPA Order # 9332004arp01/13 APR 1994/313ES

R & D Status Report #2

Reporting Period: 16th November to 15th December, 1994

Submitted by:

The Electrofuel Manufacturing Company Inc.

DTIC QUALITY INSPECTED 3

19950922 080

DISTRIBUTION STATEMENT A

Approved for public release;
Distribution Unlimited



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DEFENSE TECHNICAL INFORMATION CENTER
CAMERON STATION
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Feb 1, 1995

IN REPLY
REFER TO

DTIC-OCC

SUBJECT: Distribution Statements on Technical Documents

TO: Office of the Chief of Naval Research
800 north Quincy Street
Arlington, VA 22217-5000
Code 22

1. Reference: DoD Directive 5230.24, Distribution Statements on Technical Documents, 18 Mar 87.

2. The Defense Technical Information Center received the enclosed report (referenced below) which is not marked in accordance with the above reference.

R&D Status report
N00014-94-C-0141

3. We request the appropriate distribution statement be assigned and the report returned to DTIC within 5 working days.

4. Approved distribution statements are listed on the reverse of this letter. If you have any questions regarding these statements, call DTIC's Cataloging Branch, (703) 274-6837.

FOR THE ADMINISTRATOR:

1 Encl

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Chief, Cataloging Branch

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DISCLOSURE, 6 Nov 1984 (Indicate date of determination). CONTROLLING DOD OFFICE IS (Indicate
Controlling DoD Office).

The cited documents has been reviewed by competent authority and the following distribution statement is
hereby authorized.

<u>A</u> (Statement)		OFFICE OF NAVAL RESEARCH CORPORATE PROGRAMS DIVISION ONR 353 800 NORTH QUINCY STREET ARLINGTON, VA 22217-5660	_____ (Controlling DoD Office Name)
_____ (Reason)			_____ (Controlling DoD Office Address, City, State, Zip)
<u>Debra T. Hughes</u> (Signature & Typed Name)	DEBRA T. HUGHES DEPUTY DIRECTOR CORPORATE PROGRAMS OFFICE (Assigning Office)		15 SEP 1995 (Date Statement Assigned)

DEVELOPMENT OF AN ULTRA-SAFE RECHARGEABLE LITHIUM-ION BATTERY

R&D STATUS REPORT 1931-1002/0

ARPA Order No.: 9332004arp01/13APR1994/313ES
Program Code No.: ARPA-BAA93-32
Contractor: The Electrofuel Manufacturing Company Inc.
Contract No.: N00014-94-C-0141 Contract Amount: \$1271728.
Effective Date of Contract: August 15, 1994
Expiration Date of Contract: February 14, 1996
Principal Investigator: J.K. Jacobs
Telephone No.: (800) 388-2865
Short Title of Work: Lithium-ion Battery Development
Reporting Period: November 16, 1994 to December 15, 1994

Description of Progress:

The work continued in a number of areas, however particular focus was on two central issues:

1. Verification of bonding procedures for inter-electrode and intra-electrode bonding using a series of fluorinated vinyl copolymers as adhesives/ion-conductors. These are plasticized with organic carbonates typical of the electrolyte (eg. EC, DEC) to improve both flexibility and ion conductivity. Two procedures appear to be equally effective. These are:

- a. Coating with water based latex slurry followed by air drying and hot pressing/laminating.

- b. Solution casting, from ketone solvents, of a slurry or interlayer followed by hot air drying and "warm" laminating. Manufacturability considerations will dictate the method of choice.

2. Design of the flexible manufacturing line is further advanced than had been expected at this time, with fabrication of prototype web-handling equipment (coater, laminator, drier, and associated ancillaries) having started. Specifications of the motor/controller and gear reducer system for the web drive of the prototype battery production machine have also been completed. This step allows ordering of all major components of the flexible battery manufacturing line to proceed.

Change in Key Personnel: None

Summary of Substantive Information Derived from Special Events:
None:

Problems Encountered and/or Anticipated: None

Action Required by the Government: None

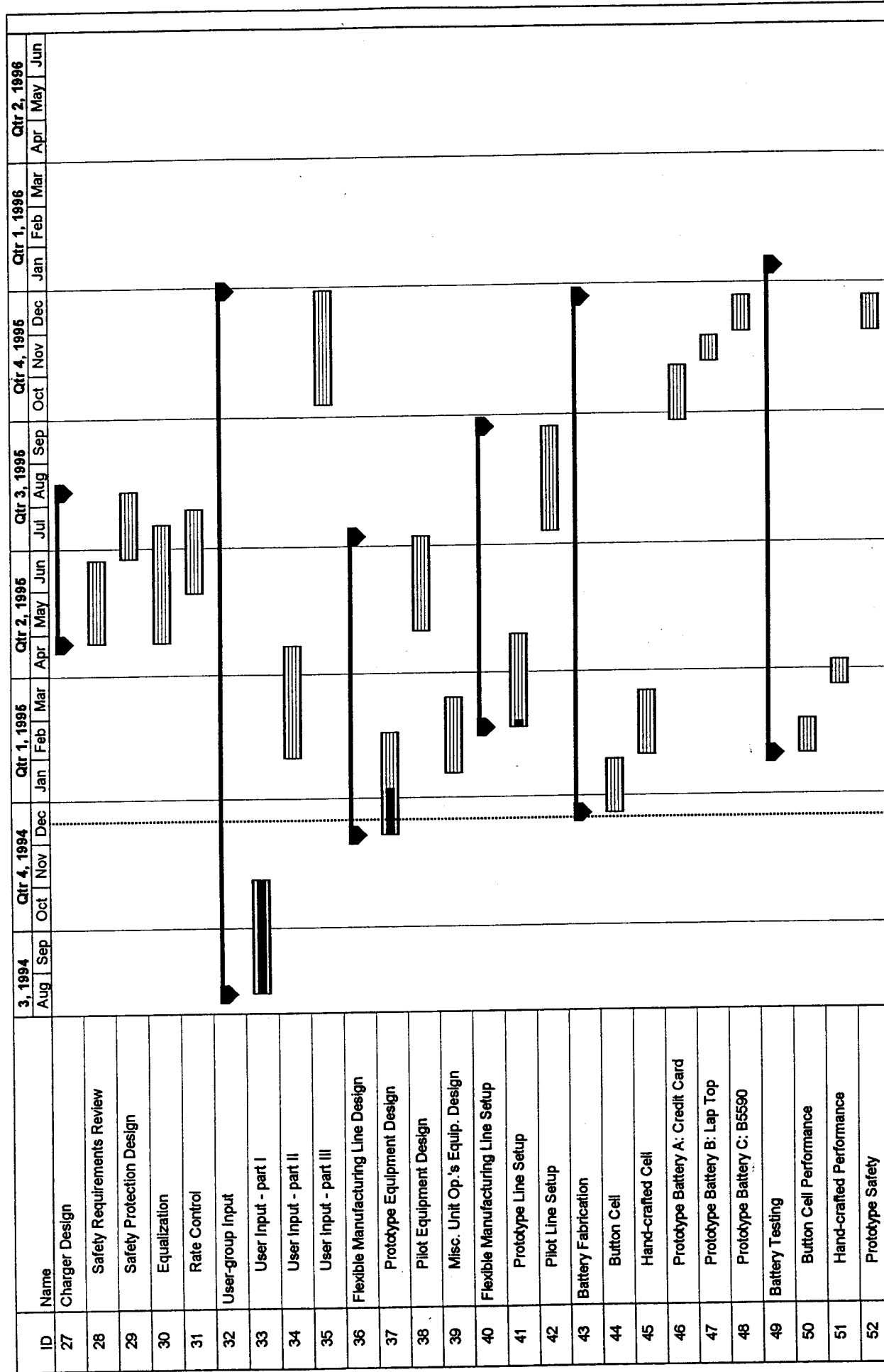
Fiscal Status:

	Total Est- imate of Program	US Govt Funding Obliga- tion	Electro fuel Contri- bution
(1) Amt. currently provided on contract:	\$1630421	\$1271728	\$358693
(2) Expenses & commitments to date:	\$ 170419	\$ 132927	\$ 37492
(3) Funds required to complete work:	\$1460002	\$1138801	\$321201

ID	Name	3, 1994			Qtr 4, 1994			Qtr 1, 1995			Qtr 2, 1995			Qtr 3, 1995			Qtr 4, 1995			Qtr 1, 1996			Qtr 2, 1996		
		Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
1	Project Start	◆																							
2	Cell Chemistry																								
3	Anode Selection																								
4	Prelim. Anode Choice																								
5	Final Anode Choice																								
6	Anode Mat'l's Prep																								
7	Cathode Selection																								
8	Preliminary Cathode Choice																								
9	Final Cathode Choice																								
10	Cathode Mat'l's Prep																								
11	Electrolyte Selection																								
12	Prelim. Electrolyte Choice																								
13	Final Electrolyte Choice																								
14	Electrolyte Mat'l's Prep																								
15	Cell Stack Design																								
16	Stack-pressure Control																								
17	Anode Fabrication																								
18	Cathode Fabrication																								
19	Current Collector Structure																								
20	Separator Prep																								
21	Packaging Design																								
22	Folding Methodology																								
23	Series/Parallel Connections																								
24	Current Collector Attachment																								
25	Lead-out Seal																								
26	Enclosure Fabrication & Seal																								

Critical  Progress  Summary 
 Noncritical  Milestone  Rolled Up 

Project: LI-ion Battery
 Date: 12/23/94



Project: Li-Ion Battery
 Date: 12/23/94

ID	Name	3, 1994			Qtr 4, 1994			Qtr 1, 1995			Qtr 2, 1995			Qtr 3, 1995			Qtr 4, 1995			Qtr 1, 1996			Qtr 2, 1996		
		Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
53	Prototype Performance																								
54	Reporting																								
55	Progress																								
56	Button Cell Report																								
57	Prototype Battery Test Report																								
58	Final Report																								
59	Project Complete																								

Project: Li-Ion Battery
Date: 12/23/94

Summary

Progress

Milestone

Summary

Rolled Up